Pacific Northwest Marine Ecoregional Assessment

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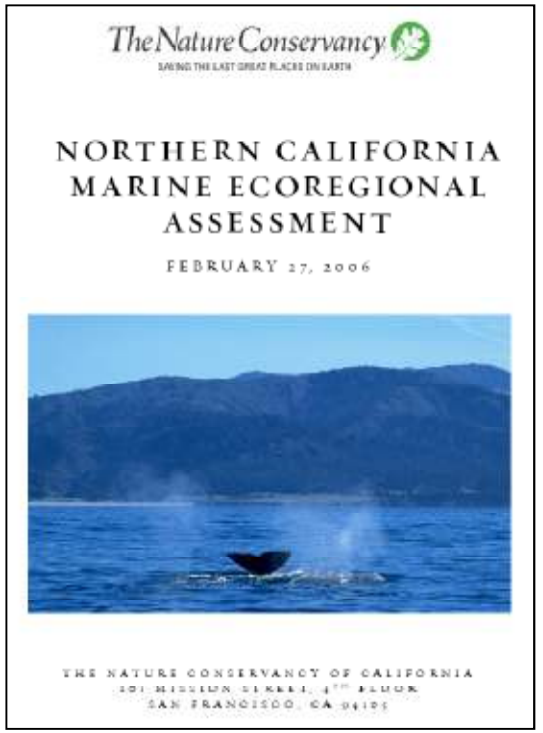
Jo Smith
Marine Spatial Planning Workshop
Grays Harbor, WA
20 Oct 2009

Ecoregional Assessments

- Identify ecologically significant areas that, if protected, represent regional biodiversity
- Regional-scale context for conservation efforts



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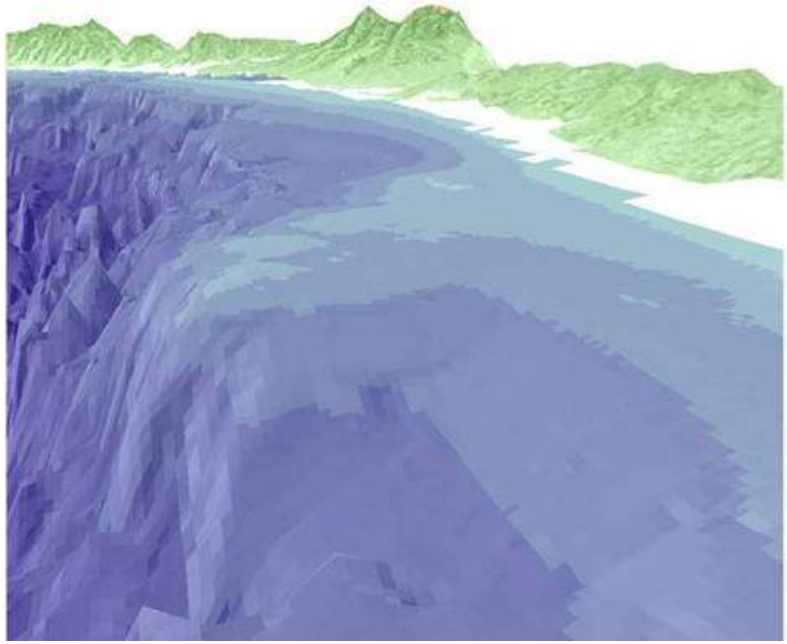
Ecoregional Assessments

strengths

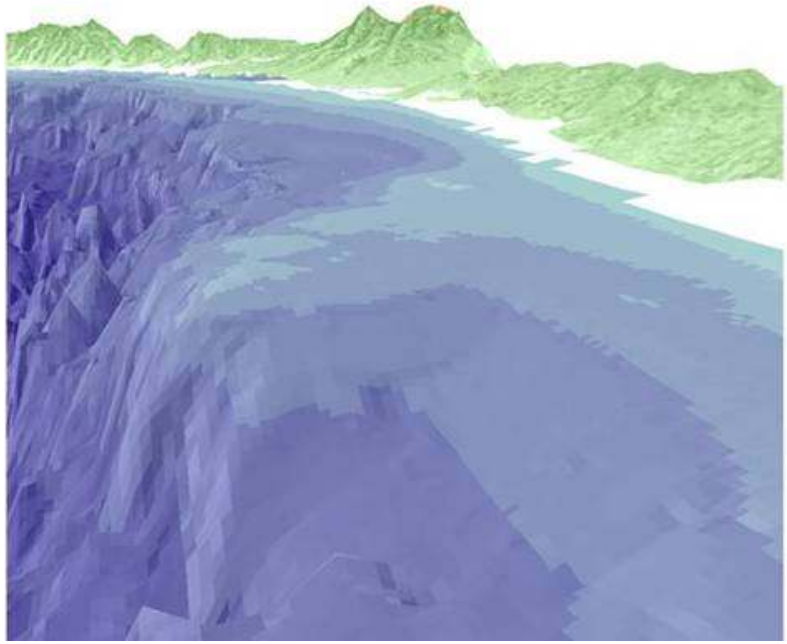
- rigorous, quantitative analysis
- spatially-explicit
- provide a framework for physical and biological features
- regionally consistent
- build credibility with partners
- identify future data needs



Ecoregional Assessments

weaknesses

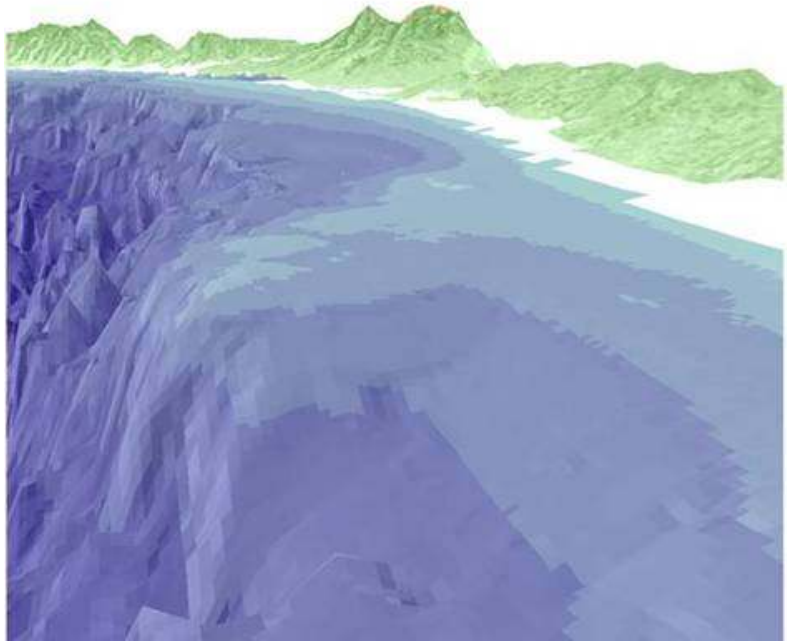
- coarse; prone to inaccuracies
- can not identify local sites of importance
- limited by available data
- scale dependent
- verification methods lacking
- cannot incorporate pelagic habitat

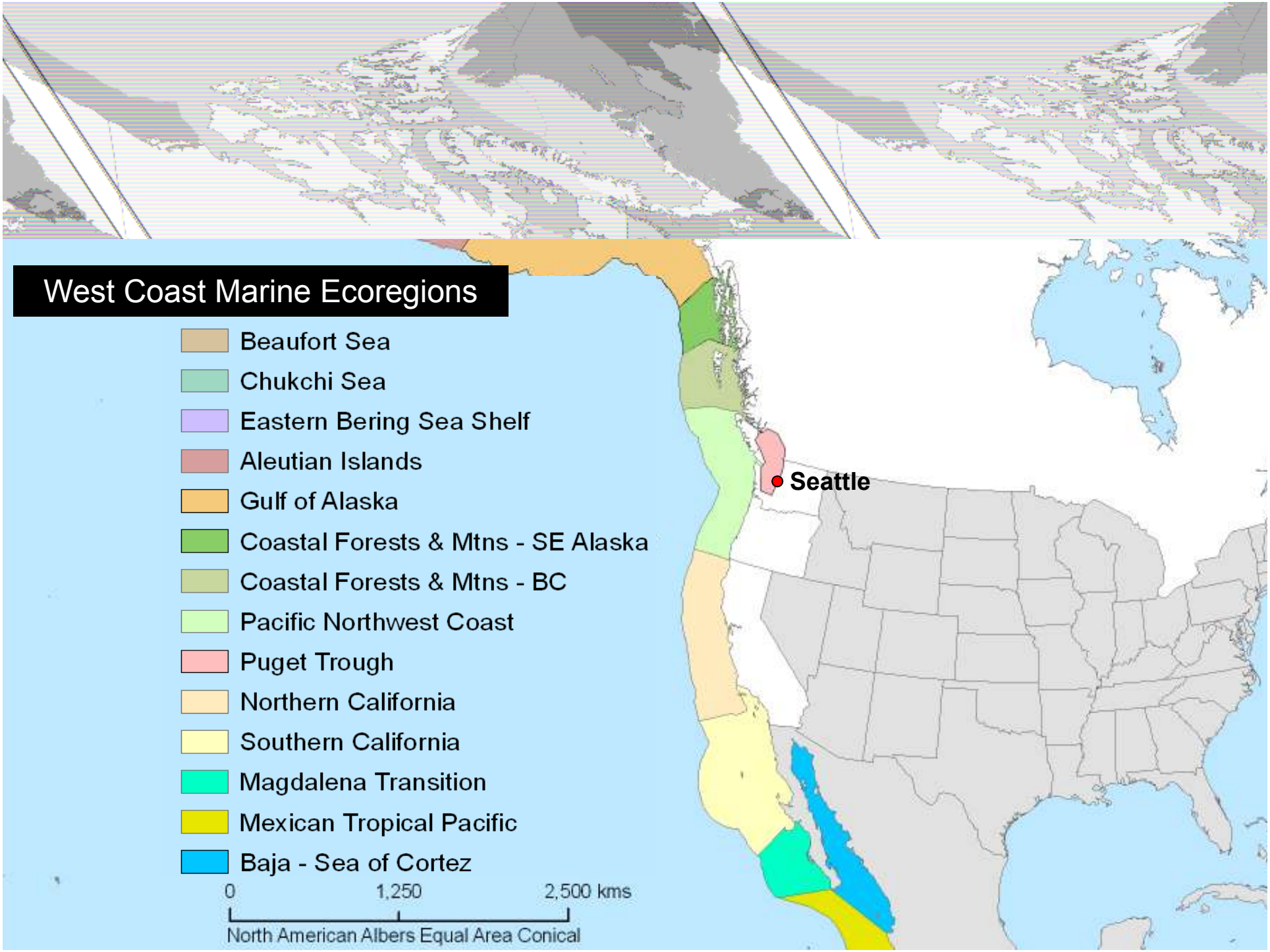


Ecoregional Assessments

are not

- regulatory
- prescriptive
- perfect




West Coast Marine Ecoregions
Beaufort Sea
Chukchi Sea
Eastern Bering Sea Shelf
Aleutian Islands
Gulf of Alaska
Coastal Forests & Mtns - SE Alaska
Coastal Forests & Mtns - BC
Pacific Northwest Coast
Puget Trough
Northern California
Southern California
Magdalena Transition
Mexican Tropical Pacific
Baja - Sea of Cortez
Seattle
0
1,250
2,500 kms
North American Albers Equal Area Conical

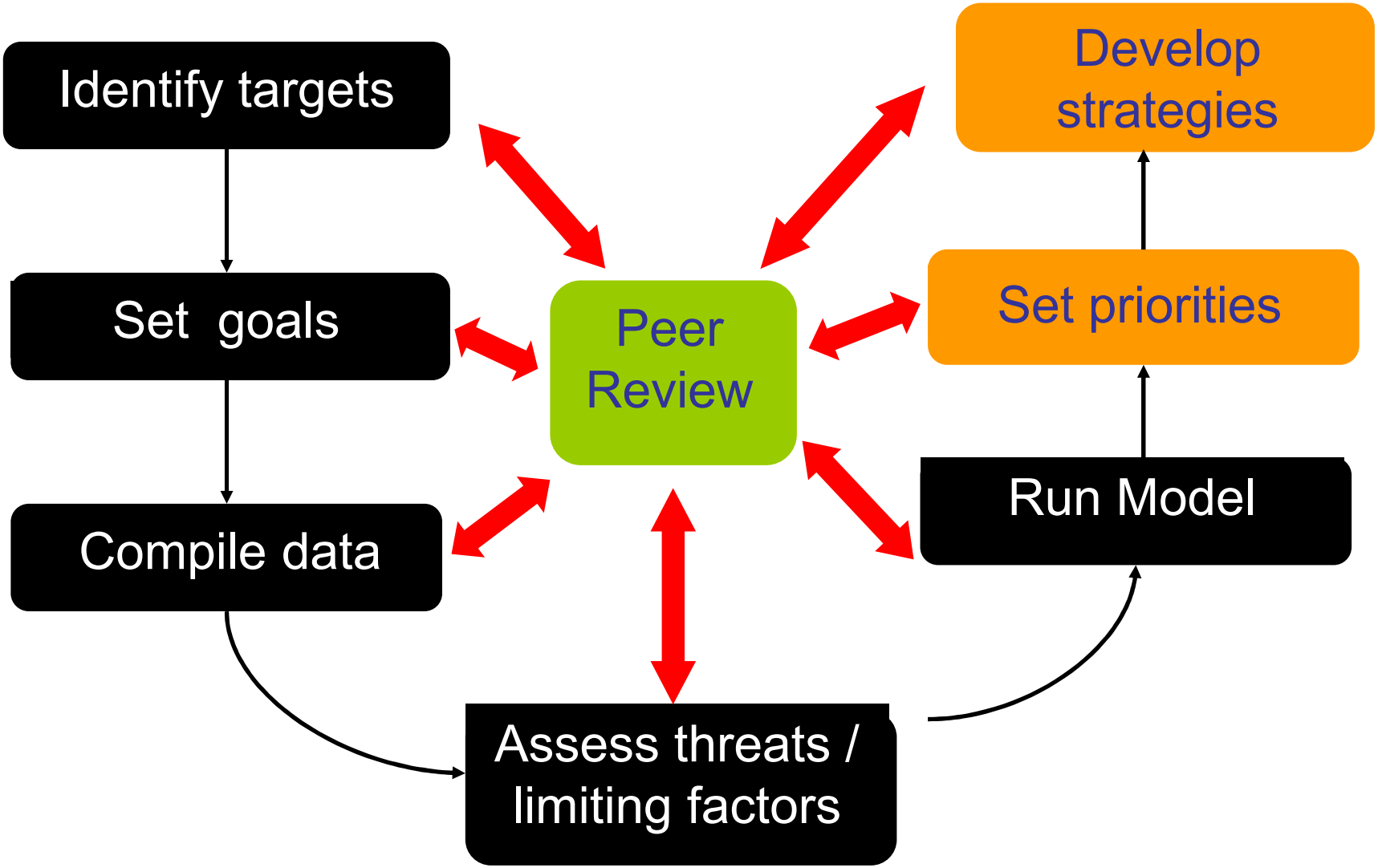
9 Completed in Washington

‘Pacific Northwest Coast’

Underway in Washington

‘Pacific Northwest Marine’

Ecoregional Assessment Approach

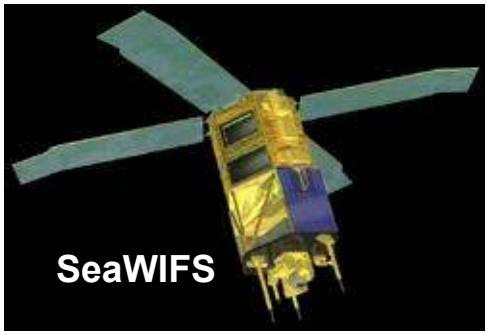


Identify conservation targets

- Species
- Habitats
- Communities

Data Sources

Oregon State UNIVERSITY OSU

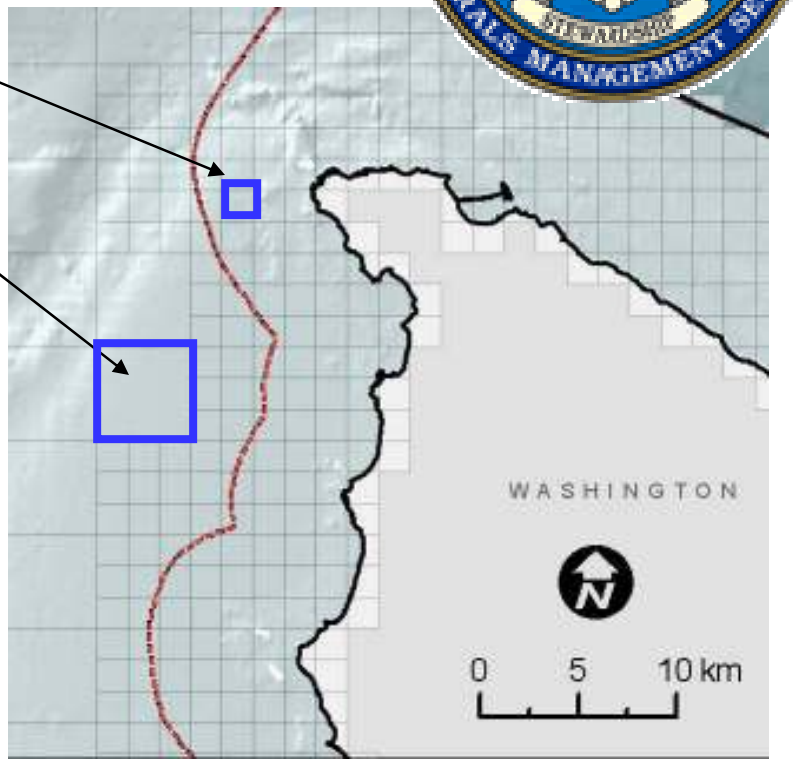


Data are organized into a grid

Minerals Management Service
"Outer Continental Shelf" grid system

State waters = 1x1 miles (256 ha)

Federal waters = 3x3 miles (2300 ha)



9,481 Assessment units:

5,924 State

3,917 Federal

Set Conservation Goals

- Conserve **representative biodiversity**

- Identify percentage/amount of targets to represent in priority conservation areas using:
  - current distribution patterns
  - historic or baseline abundance

"Suitability"

upland, coastal and offshore impacts, management designations

(-)

- Ports
- Shoreline armoring
- Coastal development
- Roads and railroads
- Boat ramps, marinas
- Finfish and shellfish leases
- Shipping routes

(+)

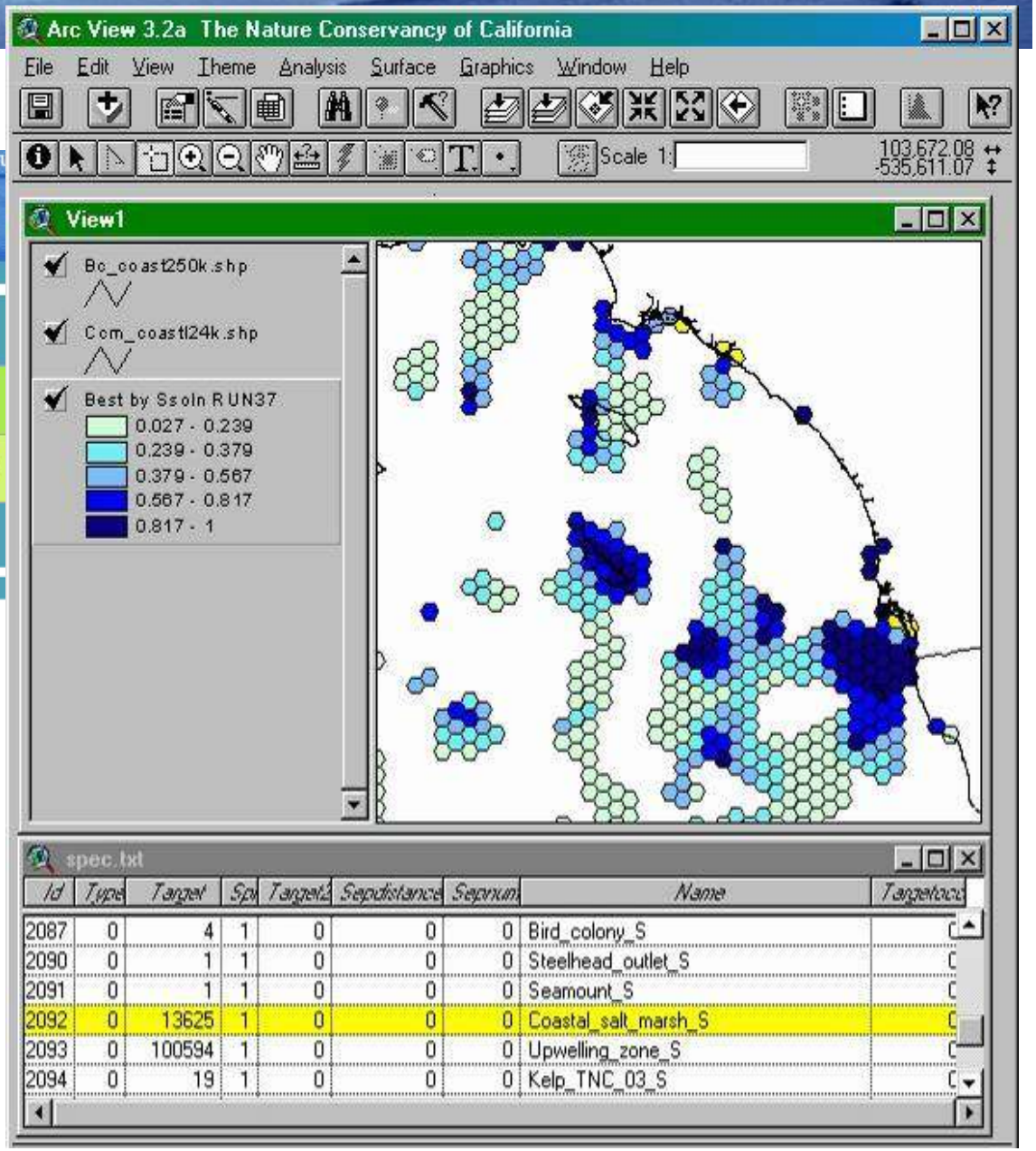
- Marine reserves/other protected areas
- Fisheries closures

Factors are assigned values to direct analysis away from areas heavily affected or used by humans – conservation at the lowest cost

Run analyses, review, rerun…

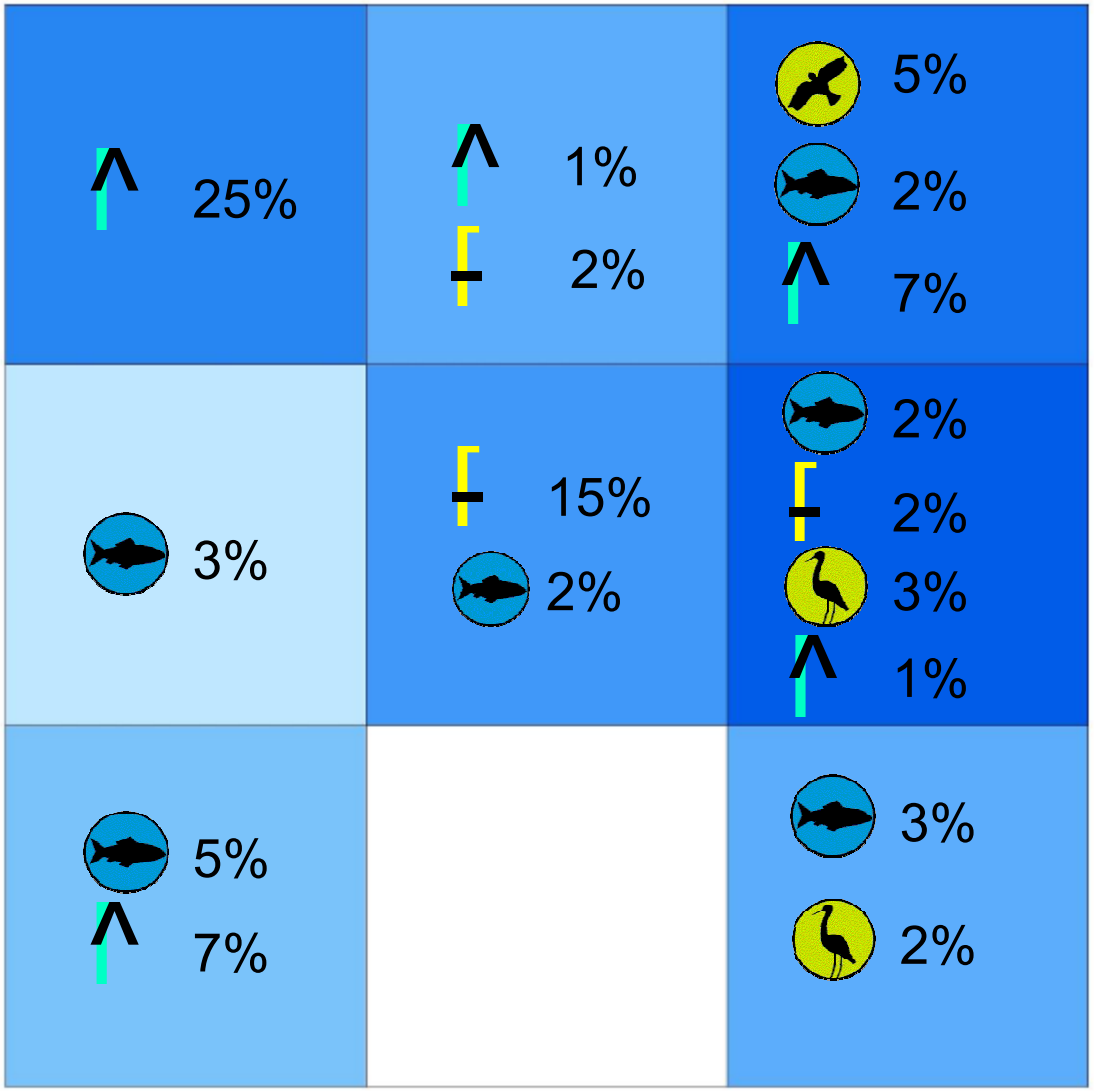
A decision support tool
that optimizes
efficient allocation
of resources
across different uses

http:/ecology.uq.edu.au/marxan



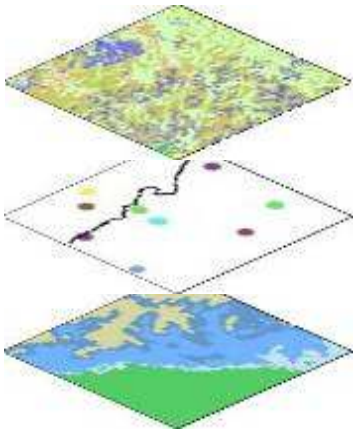
Behind the scenes…

5	3	7
1	4	9
2	0	3

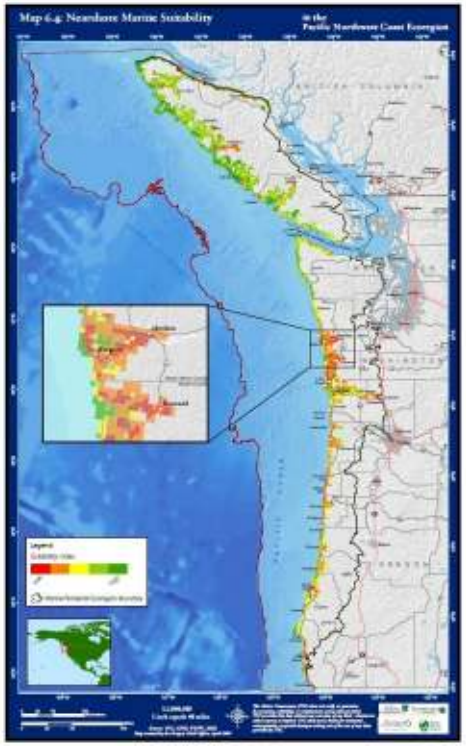


The output

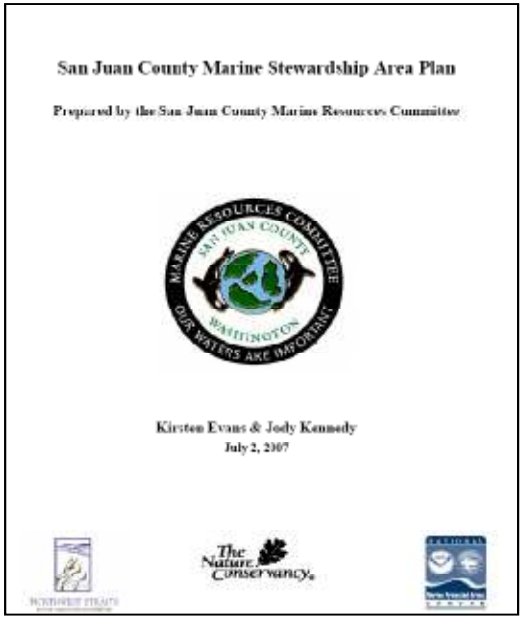
Data layers



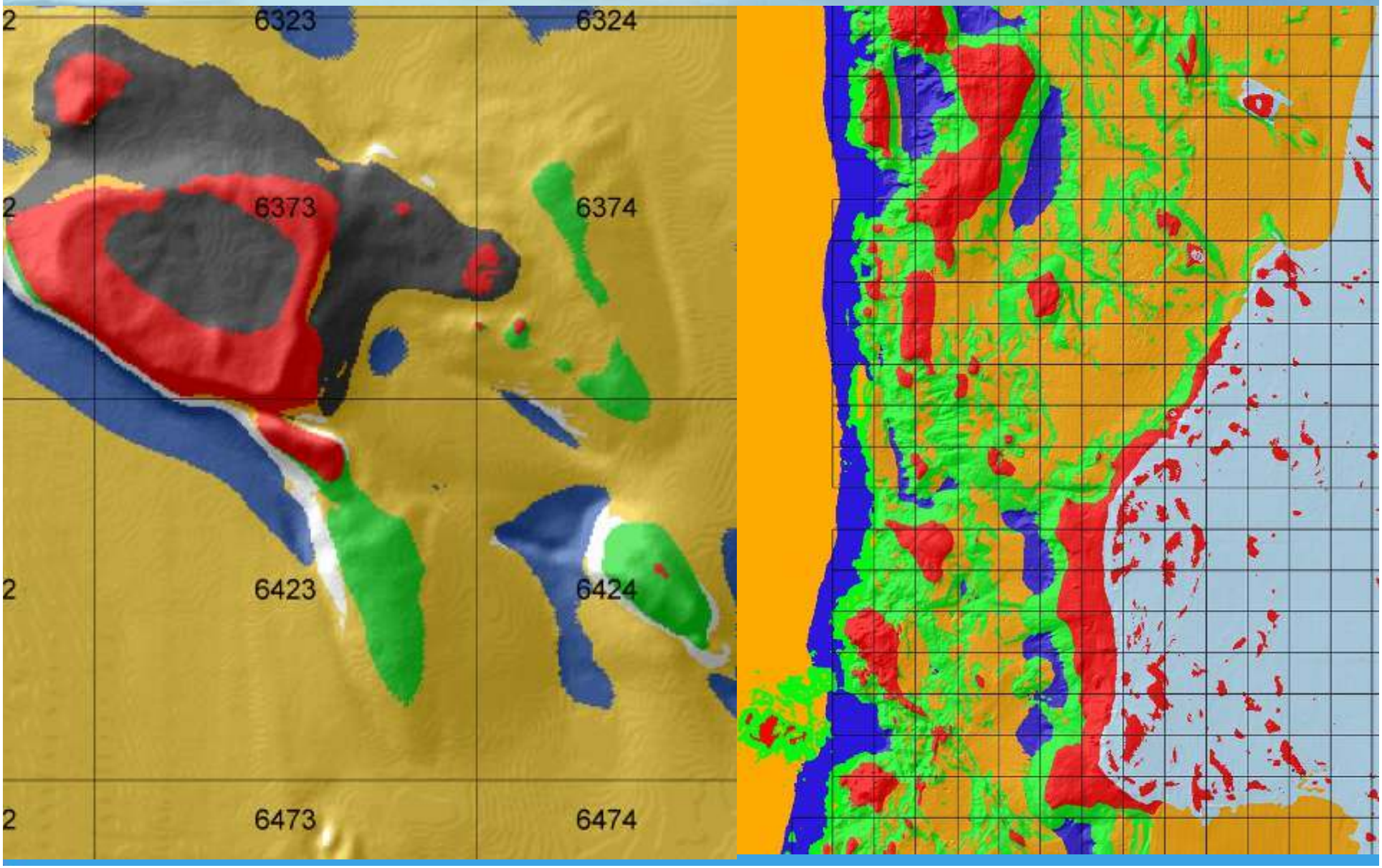
Maps



Management Plans



Building off of Regional Assessments



Building off of Regional Assessments

Coastal Resilience

adapting natural and human communities to sea level rise and coastal hazards

Partners

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NOAA

ASFPM

NASA Goddard Institute for Space Studies
New York, N.Y.

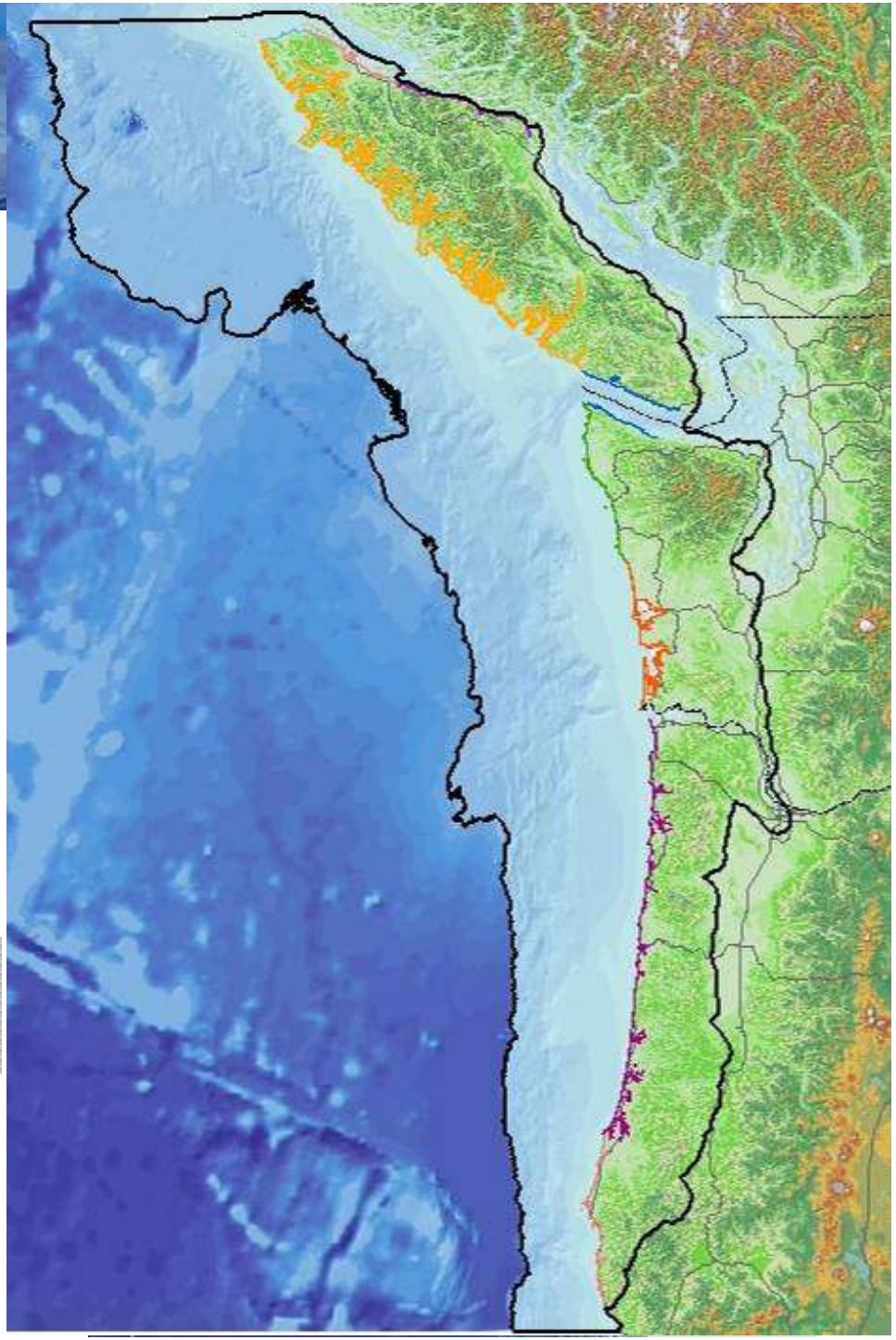
PACE LAW SCHOOL

THE UNIVERSITY OF SOUTHERN MISSISSIPPI
Geography and Geology

Pacific Northwest Marine Ecoregion

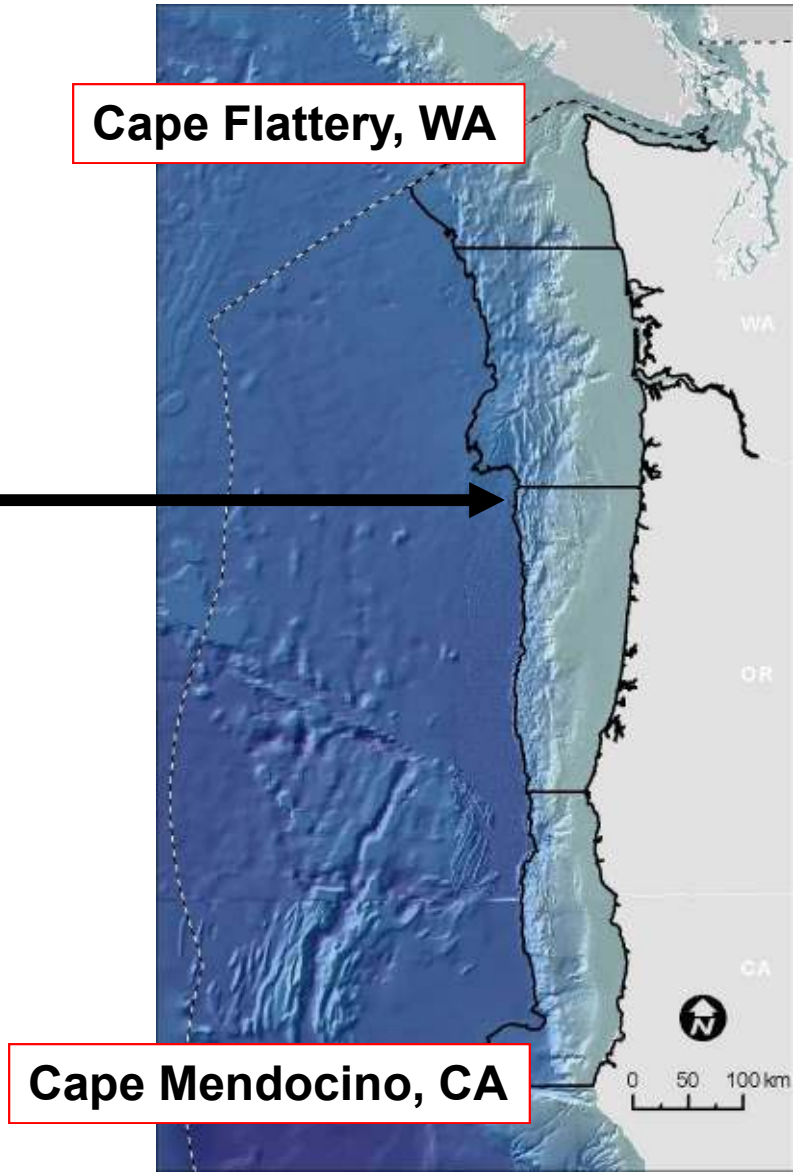
Cape Scott BC –
Cape Mendocino CA

Dick Vander Schaaf, Ken Popper,
Dan Kelly, Jo Smith, Jacques White



97,925 km^2

From the coast to the toe of the continental shelf



Conservation Targets

Coarse Filter Habitat & Community

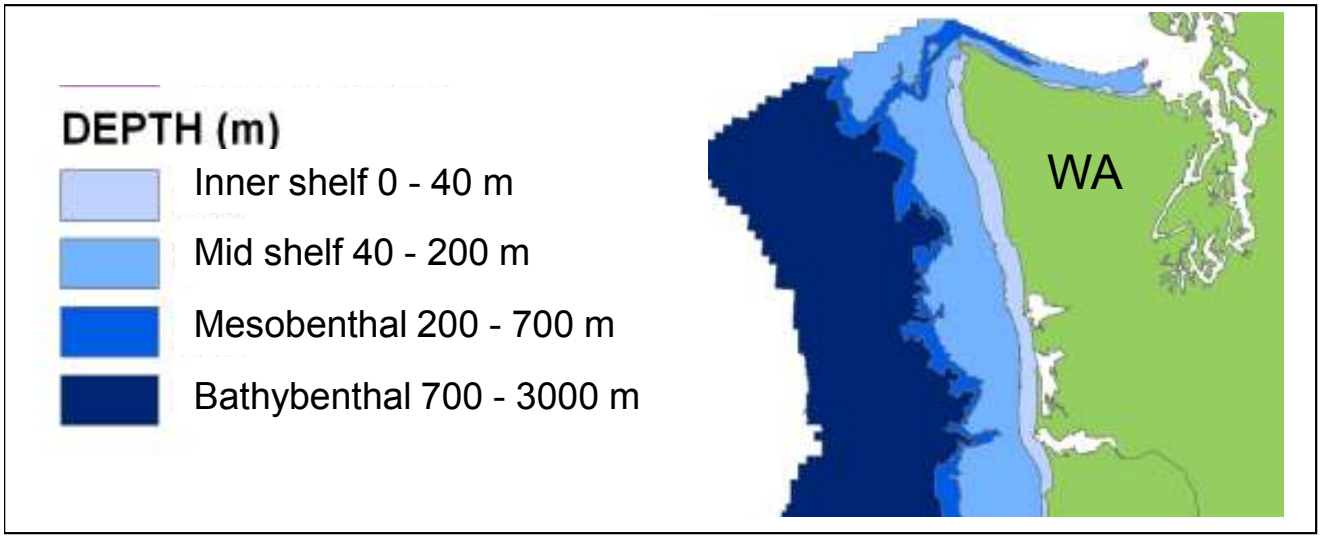
- Benthic (64)
- Estuaries (24)
- Shoreline (23)
- Nutrients (1)
- Kelp (5)
- Canyons (1)

Fine Filter Species

- Birds (13)
- Fish (51)
- Invertebrates (20)
- Mammals (17)
- Plants (15)
- Coral/sponges (8)
- oysters (1)

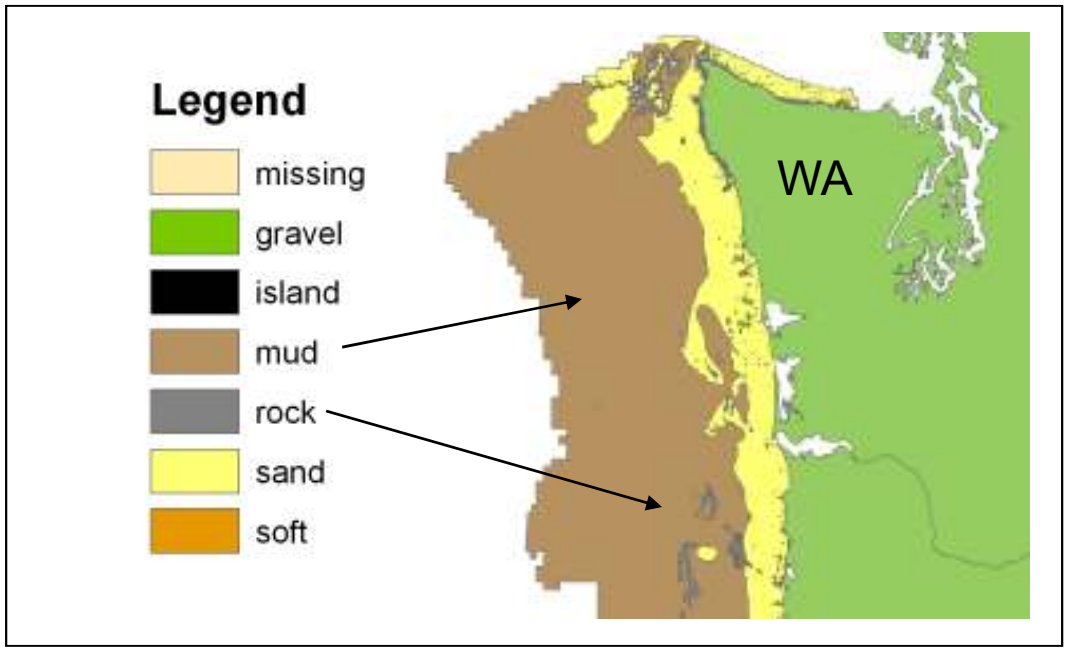
194 Targets

Bathymetry + Substrate

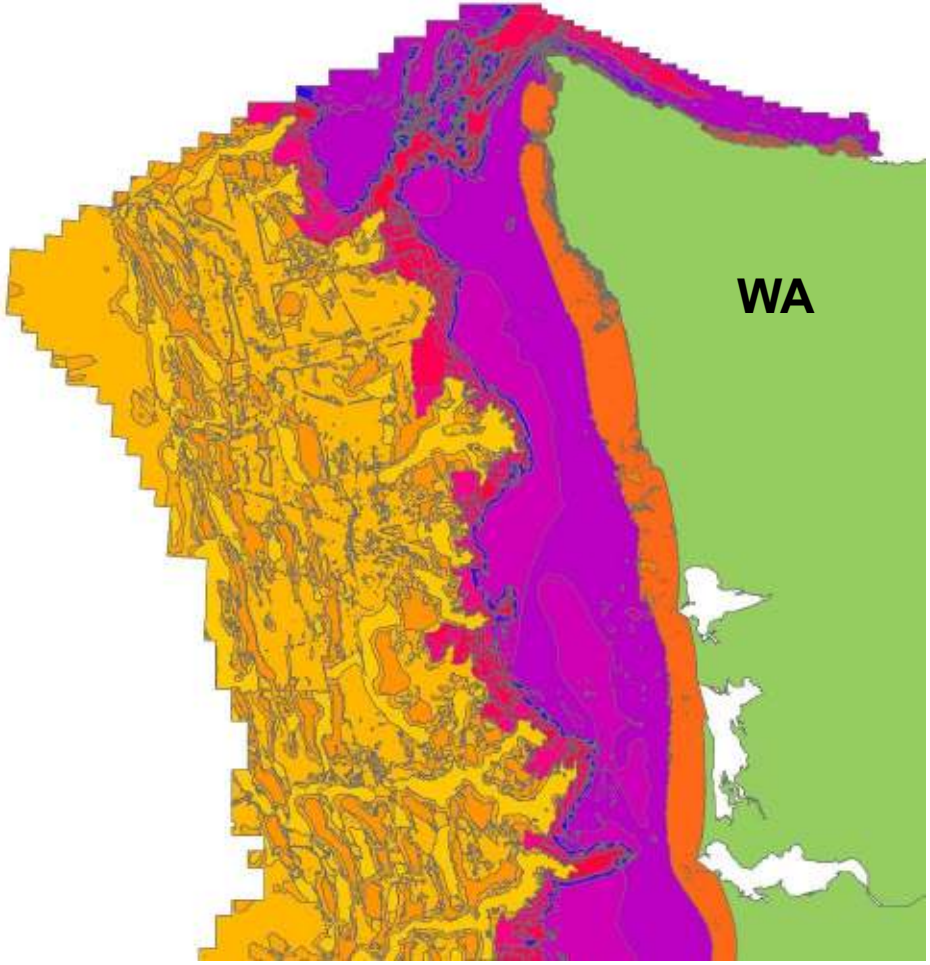


NOAA hydrographic survey
Gary Greene, MLML

Chris Goldfinger, OSU
Active Tectonics and Seafloor Mapping Lab



Benthic Habitat



Bathymetry +

Substrate +

Geomorphology

= Benthic Habitat

64 habitat types

Oregon State University OSU

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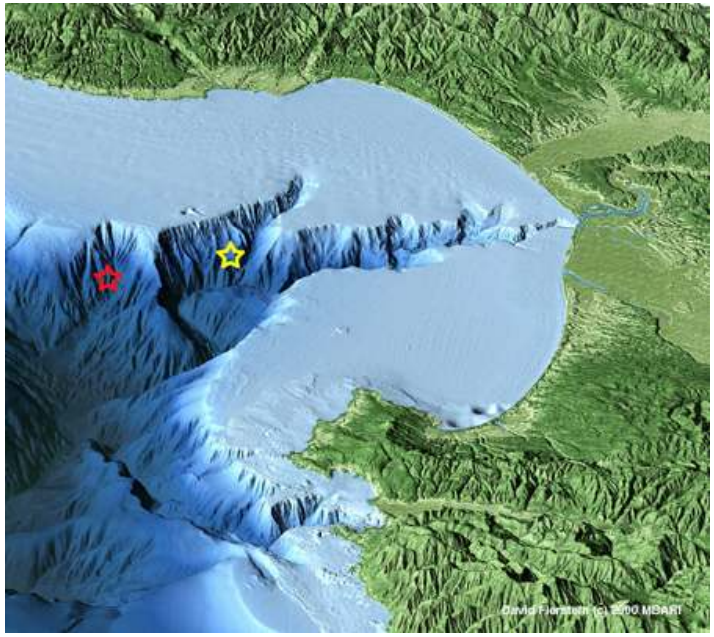
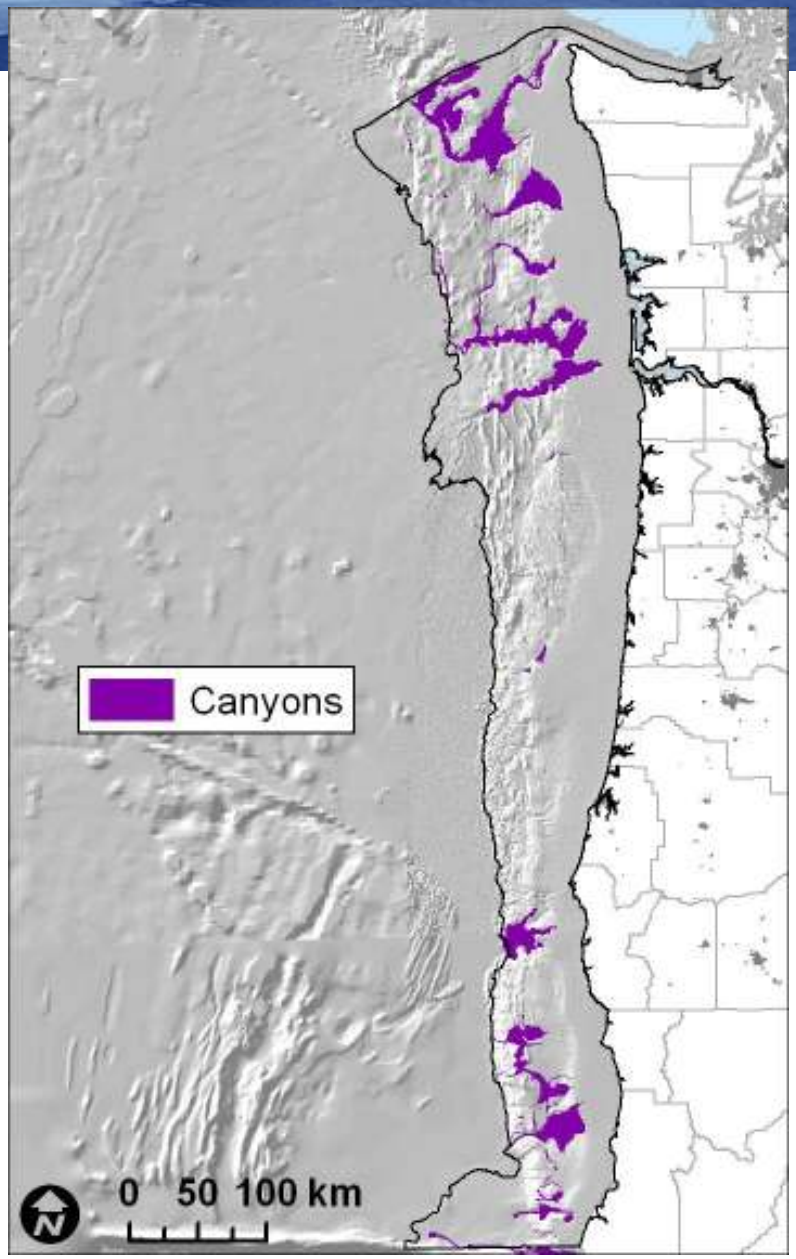
Deepwater Canyons

- Biogenic habitat



Monterey Bay Canyon, CA



Oregon State University OSU

Shoreline

- Substrate + Exposure
- 23 habitat types

Washington Department of FISH and WILDLIFE

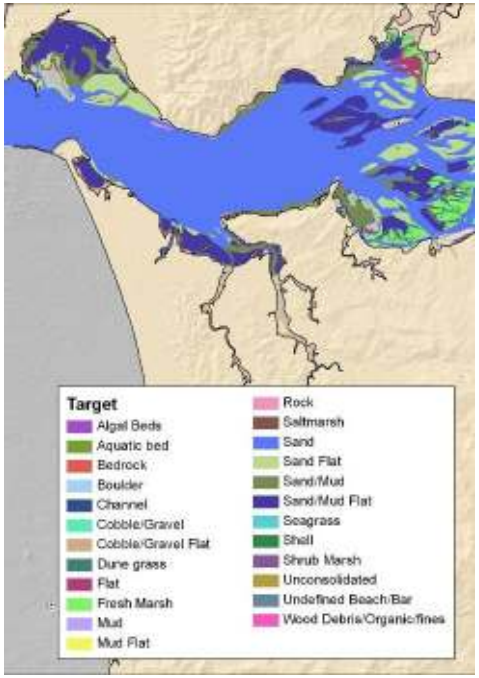
NOAA — National Oceanic and Atmospheric Administration — U.S. Department of Commerce

Washington State Department of Natural Resources

ShoreZone

Estuaries

- Vegetation + Substrate
- 24 habitat types



Eelgrass

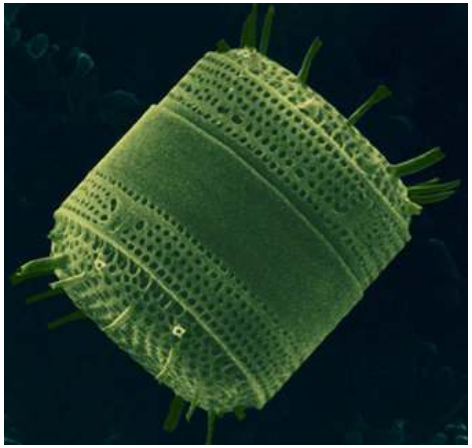
U.S. FISH & WILDLIFE SERVICE

WASHINGTON STATE DEPARTMENT OF Natural Resources

ShoreZone

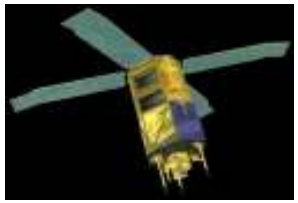
Nutrients

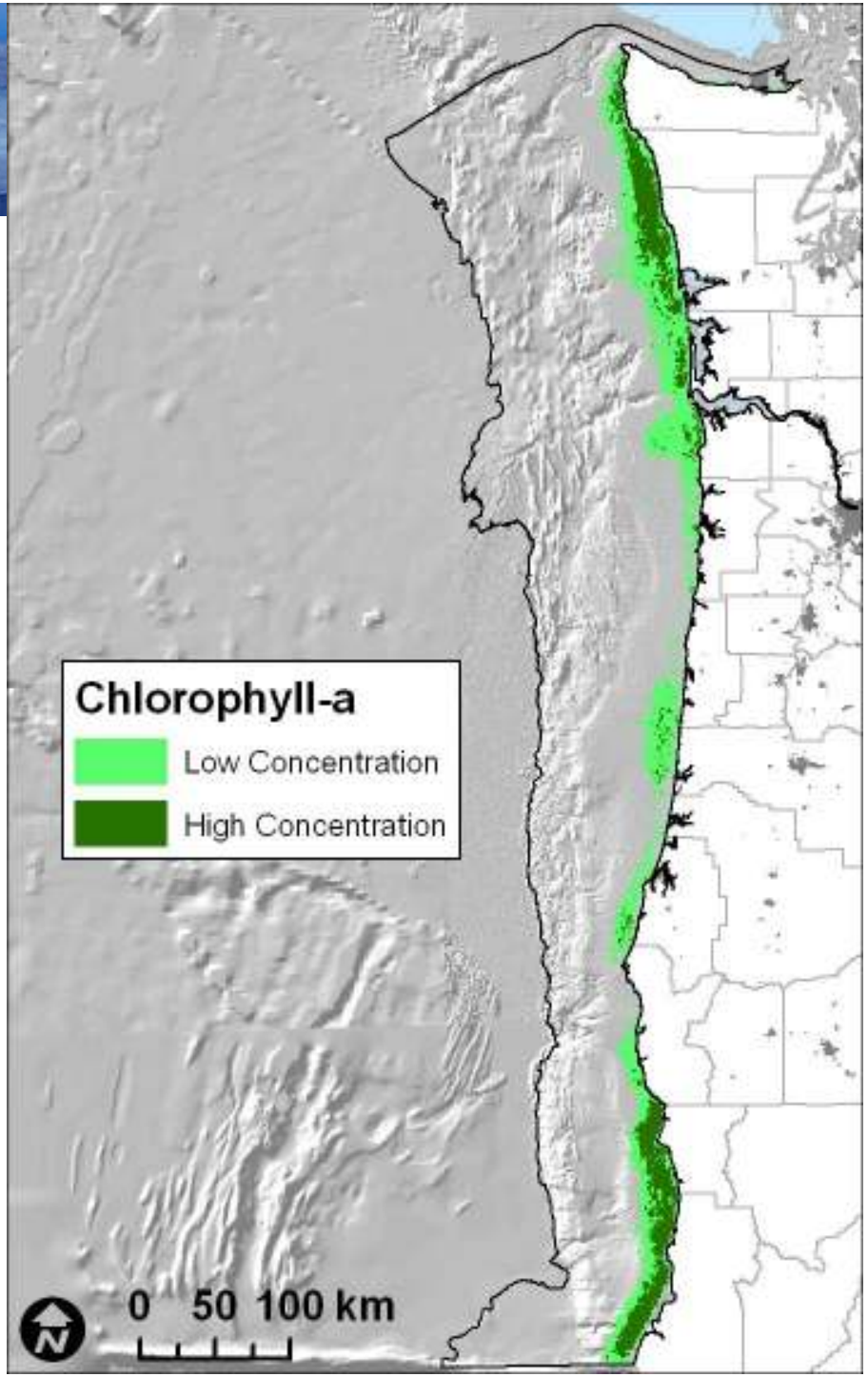
1998-2005
June-Sept



High concentrations
2+ standard deviations
Low concentrations
1-2 standard deviations

SeaWIFS



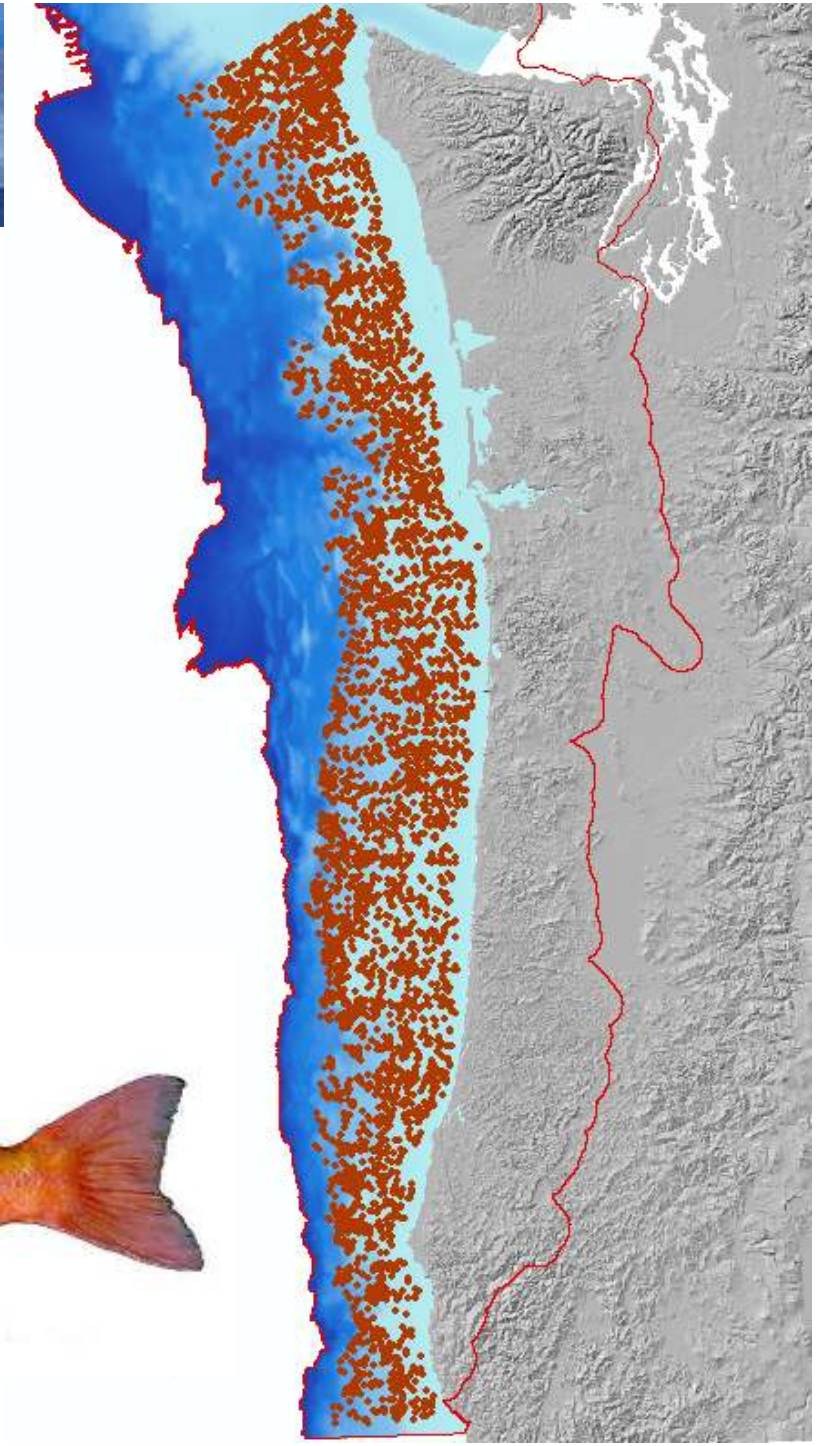


Adult groundfish

NOAA-Fisheries Trawl surveys
Alaska Fisheries Science Centre
Northwest Fisheries Science Center

1977 – 2004

5,489 trawls
1 – 5 km long tows
50 - 1280 m depth
47 Target Species



Seabirds & Marine Mammals

Seabird colonies

Marine mammal haul-outs

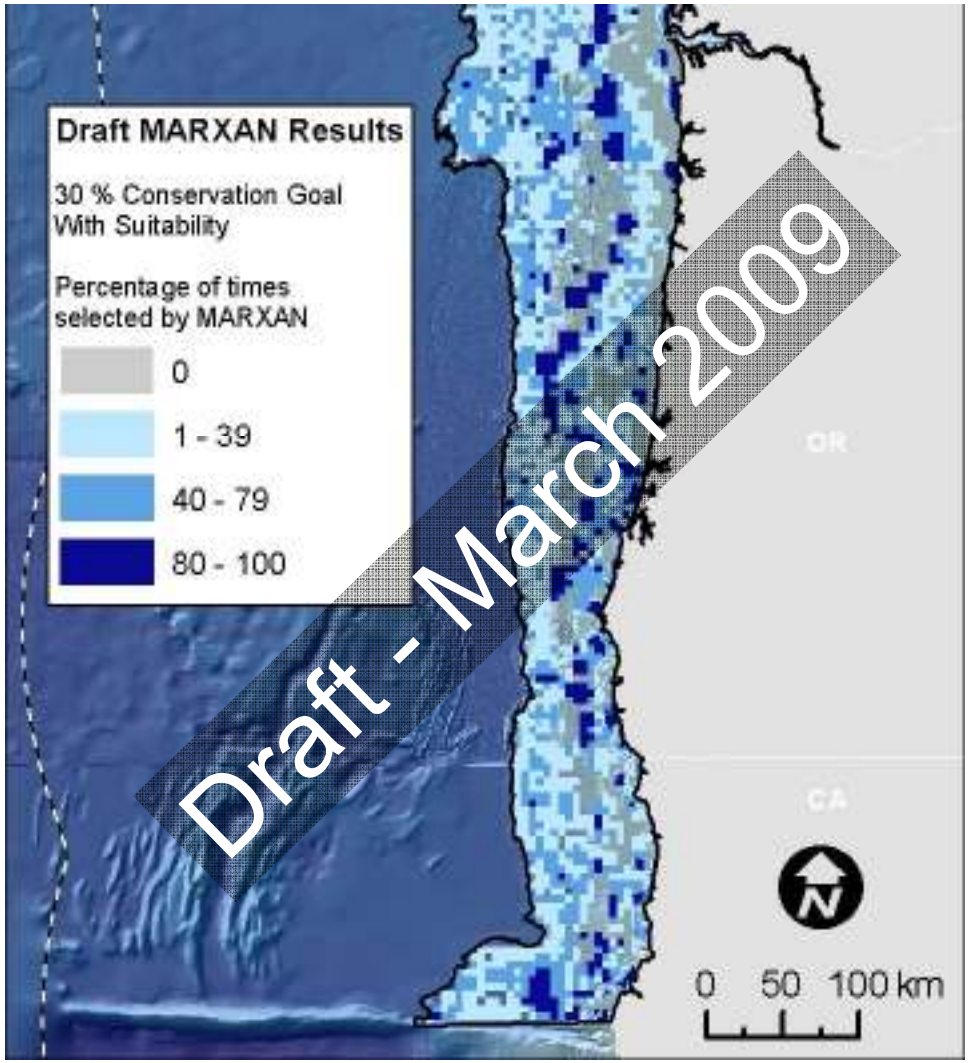
U.S. FISH & WILDLIFE SERVICE

Washington Department of FISH and WILDLIFE

USGS science for a changing world

Progress to date:

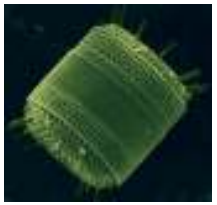
- Data
- Peer-Review
- Marxan runs
- Phase 1: Dec 2009
- Phase 2: 2010 -?



Summary

Marine Ecoregional Assessments – identifies a set of high priority areas that, if conserved and effectively managed, will protect a representative subset of the marine biodiversity in an ecoregion






Questions?

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http://nature.org

For more information, please contact:

Jo Smith, Marine Ecologist, Ph.D.
joanna_smith@tnc.org

Jacques White, Director of Marine Conservation, Ph.D
jwhite@tnc.org